IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Jun Koyama
Serial No. : Unassigned
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Title : ELECTRO-OPTICAL DEVICE AND DRIVING METHOD OF THE SAME

Art Unit : Unknown
Examiner : Unknown

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as follows:

In the claims:

Amend claims 3-5, 8-13, 18 and 19 as follows:

3. A light-emitting device having a plurality of pixels, each of said plurality of pixels comprising:

a source signal line, n (n is a natural number, $2 \leq n$) writing gate signal lines, n reading gate signal lines, n writing transistors, n reading transistors, n x m memory circuits for storing n-bit digital image signals for m frames (m is a natural number, $1 \leq m$), n writing memory circuit selection portions, n reading memory circuit selection portions, a current supply line, an EL driving transistor, and an EL element, wherein:

gate electrodes of said n writing transistors are electrically connected to different ones of said n writing gate signal lines, one of a source region and a drain region of each of said n writing transistors is electrically connected to said source signal line, and the other of the source region and the drain region of each of said n writing transistors is electrically connected to signal input portions of said n writing memory circuit selection portions;

each of said n writing memory circuit selection portions includes m signal output portions, with said m signal output portions being respectively electrically connected to signal input portions of different memory circuits;

each of said n reading memory circuit selection portions includes m signal input portions, with said m signal input portions being respectively electrically connected to signal output portions of different memory circuits; and

gate electrodes of said n reading transistors are electrically connected to different ones of said n reading gate signal lines, one of a source region and a drain region of each of said n reading transistors is electrically connected to different signal output portions of said n reading memory circuit selection portions, the other of the source region and the drain region of each of said n reading transistors is electrically connected to a gate electrode of said EL driving transistor, one of a source region and a drain region of said EL driving transistor is electrically connected to said current supply line, and the other of the source region and the drain region of said EL driving transistor is electrically connected to one electrode of said EL element.

4. A light-emitting device having a plurality of pixels, each of said plurality of pixels comprising:

n (n is a natural number, $2 \preceq n$) source signal lines, a writing gate signal line, n reading gate signal lines, n writing transistors, n reading transistors, n x m memory circuits for storing n-bit digital image signals for m frames (m is a natural number, $1 \preceq m$), n writing memory circuit selection portions, n reading memory circuit selection portions, a current supply line, an EL driving transistor, and an EL element, wherein:

gate electrodes of said n writing transistors are electrically connected to said writing gate signal line, one of a source region and a drain region of each of said n writing transistors is electrically connected to a different one of said n source signal lines, the other of the source region and the drain region of each of said n writing transistors is electrically connected to signal input portions of said n writing memory circuit selection portions;

each of said n writing memory circuit selection portions includes m signal output portions, with said m signal output portions being respectively electrically connected to signal input portions of different memory circuits;

each of said n reading memory circuit selection portions includes m signal input portions, with said m signal input portions being respectively electrically connected to signal output portions of different memory circuits;

gate electrodes of said n reading transistors are electrically connected to any different one of said n reading gate signal lines, one of a source region and a drain region is electrically connected to different signal output portions of said n reading memory circuit selection portions,

the other of the source region and the drain region of each of said n reading transistors is electrically connected to a gate electrode of the EL driving transistor, one of a source region and a drain region of said EL driving transistor is electrically connected to said current supply line, and the other of the source region and the drain region of said EL driving transistor is electrically connected to one electrode of said EL element.

5. A light-emitting device according to claim 3, wherein:

each of said writing memory circuit selection portions selects any one of said memory circuits, and is electrically connected to one of said source region and said drain region of said writing transistor to write said digital image signal into said selected memory circuit; and

each of said reading memory circuit selection portions selects any one of said memory circuits in which said digital image signal is stored, and is electrically connected to one of said source region and said drain region of said reading transistor to read out said stored digital image signal.

8. A light-emitting device according to claim 1, wherein said memory circuits are static memories (SRAM).

9. A light-emitting device according to claim 1, wherein said memory circuits are ferroelectric memories (FeRAM).

10. A light-emitting device according to claim 1, wherein said memory circuits are dynamic memories (DRAM).

11. A light-emitting device according to claim 1, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

12. A light-emitting device according to claim 1, wherein said light-emitting device is an electro-luminescence display device.

13. A light-emitting device according to claim 1, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

18. A driving method according to claim 14, wherein said light-emitting device is an electro-luminescence display device.

19. A driving method according to claim 14, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

Add claims 20-45 as follows:

--20. A light-emitting device according to claim 4, wherein:

each of said writing memory circuit selection portions selects any one of said memory circuits, and is electrically connected to one of said source region and said drain region of said writing transistor to write said digital image signal into said selected memory circuit; and

each of said reading memory circuit selection portions selects any one of said memory circuits in which said digital image signal is stored, and is electrically connected to one of said source region and said drain region of said reading transistor to read out said stored digital image signal.

21. A light-emitting device according to claim 2, wherein said memory circuits are static memories (SRAM).

22. A light-emitting device according to claim 3, wherein said memory circuits are static memories (SRAM).

23. A light-emitting device according to claim 4, wherein said memory circuits are static memories (SRAM).

24. A light-emitting device according to claim 2, wherein said memory circuits are ferroelectric memories (FeRAM).

25. A light-emitting device according to claim 3, wherein said memory circuits are ferroelectric memories (FeRAM).

26. A light-emitting device according to claim 4, wherein said memory circuits are ferroelectric memories (FeRAM).

27. A light-emitting device according to claim 2, wherein said memory circuits are dynamic memories (DRAM).

28. A light-emitting device according to claim 3, wherein said memory circuits are dynamic memories (DRAM).

29. A light-emitting device according to claim 4, wherein said memory circuits are dynamic memories (DRAM).

30. A light-emitting device according to claim 2, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

31. A light-emitting device according to claim 3, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

32. A light-emitting device according to claim 4, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

33. A light-emitting device according to claim 2, wherein said light-emitting device is an electro-luminescence display device.

34. A light-emitting device according to claim 3, wherein said light-emitting device is an electro-luminescence display device.

35. A light-emitting device according to claim 4, wherein said light-emitting device is an electro-luminescence display device.

36. A light-emitting device according to claim 2, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

37. A light-emitting device according to claim 3, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

38. A light-emitting device according to claim 4, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

39. A driving method according to claim 15, wherein said light-emitting device is an electro-luminescence display device.

40. A driving method according to claim 16, wherein said light-emitting device is an electro-luminescence display device.

41. A driving method according to claim 15, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

42. A driving method according to claim 16, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

43. The light-emitting device of claim 2, wherein $m > 1$.

44. The light-emitting device of claim 3, wherein $m > 1$.

45. The light-emitting device of claim 4, wherein $m > 1$.--

REMARKS

The amendments to the claims made herein are to correct minor grammatical errors and to place the application in better form for examination. No new matter is added.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be examined. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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Version with markings to show changes made

In the claims:

Claims 3-5, 8-13, 18 and 19 have been amended as follows:

3. (Amended) A light-emitting device having a plurality of pixels, each of said plurality of pixels comprising:

a source signal line, n (n is a natural number, $2 \leq n$) writing gate signal lines, n reading gate signal lines, n writing transistors, n reading transistors, n x m memory circuits for storing n-bit digital image signals for m frames (m is a natural number, $1 \leq m$), n writing memory circuit selection portions, n reading memory circuit selection portions, a current supply line, an EL driving transistor, and an EL element, wherein:

[each of] gate electrodes of said n writing transistors **[is]** are electrically connected to **[any]** different **[one]** ones of said n writing gate signal lines, one of a source region and a drain region of each of said n writing transistors is electrically connected to said source signal line, and the other of the source region and the drain region of each of said n writing transistors is electrically connected to **[any different one]** signal input **[portion]** portions of said n writing memory circuit selection portions;

each of said n writing memory circuit selection portions includes m signal output portions, with said m signal output portions **[are]** being respectively electrically connected to signal input portions of **[said]** different **[m]** memory circuits;

each of said n reading memory circuit selection portions includes m signal input portions, with said m signal input portions **[are]** being respectively electrically connected to signal output portions of **[said]** different **[m]** memory circuits; and

[each of] gate electrodes of said n reading transistors **[is]** are electrically connected to **[any]** different **[one]** ones of said n reading gate signal lines, one of a source region and a drain region of each of said n reading transistors is electrically connected to **[any]** different **[one]** signal output **[portion]** portions of said n reading memory circuit selection portions, the other of the source region and the drain region of each of said n reading transistors is electrically connected to a gate electrode of said EL driving transistor, one of a source region and a drain region of said EL driving transistor is electrically connected to said current supply line, and the

other of the source region and the drain region of said EL driving transistor is electrically connected to one electrode of said EL element.

4. (Amended) A light-emitting device having a plurality of pixels, each of said plurality of pixels comprising:

n (n is a natural number, $2 \leq n$) source signal lines, a writing gate signal **[lines]** line, n reading gate signal lines, n writing transistors, n reading transistors, n x m memory circuits for storing n-bit digital image signals for m frames (m is a natural number, $1 \leq m$), n writing memory circuit selection portions, n reading memory circuit selection portions, a current supply line, an EL driving transistor, and an EL element, wherein:

[each of] gate electrodes of said n writing transistors **[is]** are electrically connected to said writing gate signal line, one of a source region and a drain region of each of said n writing transistors is electrically connected to **[any]** a different one of said n source signal lines, the other of the source region and the drain region of each of said n writing transistors is electrically connected to **[any different one]** signal input **[portion]** portions of said n writing memory circuit selection portions;

each of said n writing memory circuit selection portions includes m signal output portions, with said m signal output portions **[are]** being respectively electrically connected to signal input portions of **[said]** different **[m]** memory circuits;

each of said n reading memory circuit selection portions includes m signal input portions, with said m signal input portions **[are]** being respectively electrically connected to signal output portions of **[said]** different **[m]** memory circuits;

[each of] gate electrodes of said n reading transistors **[is]** are electrically connected to any different one of said n reading gate signal lines, one of a source region and a drain region is electrically connected to **[any]** different **[one]** signal output **[portion]** portions of said n reading memory circuit selection portions, the other of the source region and the drain region of each of said n reading transistors is electrically connected to a gate electrode of the EL driving transistor, one of a source region and a drain region of said EL driving transistor is electrically connected to said current supply line, and the other of the source region and the drain region of said EL driving transistor is electrically connected to one electrode of said EL element.

5. (Amended) A light-emitting device according to claim 3 **[or 4]**, wherein:

each of said writing memory circuit selection portions selects any one of said **[m]** memory circuits, and is electrically connected to one of said source region and said drain region of said writing transistor to write said digital image signal into said selected memory circuit; and

each of said reading memory circuit selection portions selects any one of said memory circuits in which said digital image signal is stored, and is electrically connected to one of said source region and said drain region of said reading transistor to read out said stored digital image signal.

8. (Amended) A light-emitting device according to **[any one of claims 1 to 4]** claim 1, wherein said memory circuits are static memories (SRAM).

9. (Amended) A light-emitting device according to **[any one of claims 1 to 4]** claim 1, wherein said memory circuits are ferroelectric memories (FeRAM).

10. (Amended) A light-emitting device according to **[any one of claims 1 to 4]** claim 1, wherein said memory circuits are dynamic memories (DRAM).

11. (Amended) A light-emitting device according to **[any one of claims 1 to 4]** claim 1, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

12. (Amended) A light-emitting device according to **[any one of claims 1 to 4]** claim 1, wherein said light-emitting device is an electro-luminescence display device.

13. (Amended) A light-emitting device according to **[any one of claims 1 to 4]** claim 1, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

18. (Amended) A driving method according to **[any one of claims 14-16]** claim 14, wherein said light-emitting device is an electro-luminescence display device.

19. (Amended) A driving method according to **[any one of claims 14-16]** claim 14, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

Claims 20-45 have been added as follows:

--20. A light-emitting device according to claim 4, wherein:

each of said writing memory circuit selection portions selects any one of said memory circuits, and is electrically connected to one of said source region and said drain region of said writing transistor to write said digital image signal into said selected memory circuit; and

each of said reading memory circuit selection portions selects any one of said memory circuits in which said digital image signal is stored, and is electrically connected to one of said source region and said drain region of said reading transistor to read out said stored digital image signal.

21. A light-emitting device according to claim 2, wherein said memory circuits are static memories (SRAM).

22. A light-emitting device according to claim 3, wherein said memory circuits are static memories (SRAM).

23. A light-emitting device according to claim 4, wherein said memory circuits are static memories (SRAM).

24. A light-emitting device according to claim 2, wherein said memory circuits are ferroelectric memories (FeRAM).

25. A light-emitting device according to claim 3, wherein said memory circuits are ferroelectric memories (FeRAM).

26. A light-emitting device according to claim 4, wherein said memory circuits are ferroelectric memories (FeRAM).

27. A light-emitting device according to claim 2, wherein said memory circuits are dynamic memories (DRAM).

28. A light-emitting device according to claim 3, wherein said memory circuits are dynamic memories (DRAM).

29. A light-emitting device according to claim 4, wherein said memory circuits are dynamic memories (DRAM).

30. A light-emitting device according to claim 2, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

31. A light-emitting device according to claim 3, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

32. A light-emitting device according to claim 4, wherein said memory circuits are formed over one selected from the group consisting of a glass substrate, a plastic substrate, a stainless substrate, and a single crystal wafer.

33. A light-emitting device according to claim 2, wherein said light-emitting device is an electro-luminescence display device.

34. A light-emitting device according to claim 3, wherein said light-emitting device is an electro-luminescence display device.

35. A light-emitting device according to claim 4, wherein said light-emitting device is an electro-luminescence display device.

36. A light-emitting device according to claim 2, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

37. A light-emitting device according to claim 3, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

38. A light-emitting device according to claim 4, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

39. A driving method according to claim 15, wherein said light-emitting device is an electro-luminescence display device.

40. A driving method according to claim 16, wherein said light-emitting device is an electro-luminescence display device.

41. A driving method according to claim 15, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

42. A driving method according to claim 16, wherein said light-emitting device is incorporated in one selected from the group consisting of a video camera, a personal computer, portable telephone, a head-mount display, a digital camera, and a portable electronic book.

43. The light-emitting device of claim 2, wherein $m > 1$.

44. The light-emitting device of claim 3, wherein $m > 1$.

45. The light-emitting device of claim 4, wherein $m > 1$.--